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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,642	02/27/2002	Katsuyoshi Terakado	381KA/50987	1799

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CROWELL & MORING LLP  
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EXAMINER

EVANS, ROBIN OCTAVIA

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 08/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/083,642

Applicant(s)

TERAKADO ET AL.

Examiner

Robin O. Evans

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8, 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on February 19, 2004 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 4-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Publication WO 01/55585 (see EP 1 262654 for reading and understanding) in view of Kosco (6,338,747).

The international publication shows an electronic fuel injector having a valve member 31 and a swirler 21 made out of a sintered alloy such as SUS 416 (see EP 654, column 6, paragraph 32). SUS 416 is a martensitic stainless steel. The publication does not disclose the hardness or the density of the SUS416 alloy. Kosco discloses, in column 9, line 65 – column 10, line 26, compact stainless steel materials that are sintered to have a hardness of RB 95 and a density of and a density of 7.05. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the swirler described in the international

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publication with a hardness of 95 so as to have an element that possesses an increased surface hardness, high strength and high contact endurance as suggested by Kosco in column 1, lines 20-26 which would result in a durable and long lasting element.

As to claim 12 and the limitation that the swirler wears and the valve member does not wear, it is deemed that this recitation is considered a functional limitation and since the combination fuel injector includes all of the structural limitations this functional limitation will inherently be performed during the operation of the device.

As to claims 9 and 10 and the limitations of the shape and depth of the swirler it is deemed that the shape and depth of the swirler will be determined by the user having a desired result in mind.

As to claim 10 and the limitation of the tightness of the swirler, it is deemed that the tightness of the swirler will inherently fall in the recited range since the hardness limitation is met through sintering.

4. Claims 1 and 4-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Publication WO 01/55585 (see EP 1 262654 for reading and understanding) in view of Sato et al. (5,466,276).

The international publication shows an electronic fuel injector having a valve member 31 and a swirler 21 made out of a sintered alloy such as SUS 416 (see EP 654, column 6, paragraph 32). SUS 416 is a martensitic stainless steel. The publication does not disclose the hardness or the density of the SUS416 alloy. Sato et al. disclose, in column 8, lines 16-66, compact martensitic alloy materials that are sintered to have a hardness of about RB 100 and a density of 6.8. Therefore it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to have made the swirler described in the international publication with a hardness of about 100 so as to have an element that possesses an increased surface hardness, high strength and high wear resistance as suggested by Sato et al. in column 5, lines 17-43 which would result in a durable and long lasting element.

As to claim 12 and the limitation that the swirler wears and the valve member does not wear, it is deemed that this recitation is considered a functional limitation and since the combination fuel injector includes all of the structural limitations this functional limitation will inherently be performed during the operation of the device.

As to claims 9 and 10 and the limitations of the shape and depth of the swirler it is deemed that the shape and depth of the swirler will be determined by the user having a desired result in mind.

As to claim 10 and the limitation of the tightness of the swirler, it is deemed that the tightness of the swirler will inherently fall in the recited range since the hardness limitation is met through sintering and Sato et al. also disclose that the alloy will be denser after sintering (see column 8, lines 4-14).

### ***Conclusion***

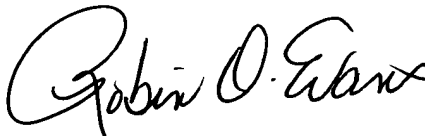
5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pinnow discloses a martensitic stainless steel having a hardness of 92. Honma discloses a powdered sintered alloy having the desired hardness and density. Kaufman, Purnell et al., and Larson et al. disclose material in the general state of the art of the invention.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robin O. Evans whose telephone number is (703) 305-5766. The examiner can normally be reached on Monday-Thursday 6:30 am- 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mar can be reached on (703) 308-2087. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Robin O. Evans  
Primary Examiner  
Art Unit 3742  
7/31/04

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